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Surface Sediment Recovery Depth Discussion with EPA

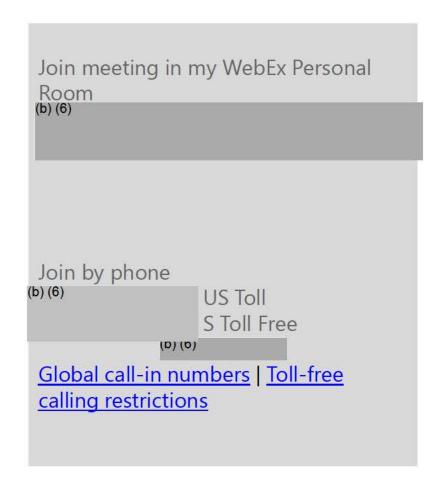
Portland Harbor Superfund Site Pre-Remedial Design AOC Baseline Investigation

May 2, 2018

Agenda and Call-in Information



- Bottom conditions
 - Field observations
 - photos and field logs
- RI map comparison
- Protocol Discussion



Substrate Conditions and Types of Refusal



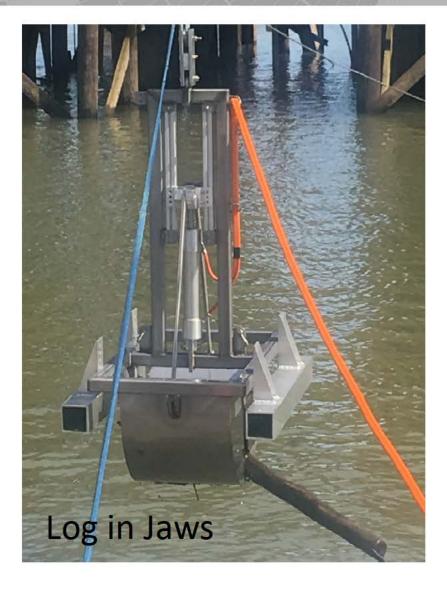
- Wood debris (stuck in jaws, or predominant matrix)
- Loose gravel rock and riprap (stuck in jaws)
- Overpenetration
- Steep slopes
- Bedrock
- Hard, dense bottom (sand/gravel)

Power Grab

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- Stainless steel construction, built for this project
- 34 cm penetration depth
- 1000 lbs closing force
- Stable frame
- Total weight is 490 lbs
 - Grab = 240 lbs
 - Ballast weight can be added = 250 lbs





SG-B319, Attempt #1

Silt over Sand & Cobbles (Low Recovery)

- Encountered at, for example:
- SG-B016
- SG-B399
- SG-B391



Wood Debris



Sand (Low Recovery, Station B050)

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4 attempts at primary station with 0, 15, 16, and 16 cm recovery depth) **A≣COM**



Sample collected on 4.4.18

Cobbles in Jaws



Station B419: Cobbles and Sand 3 attempts at primary location, abandoned for now

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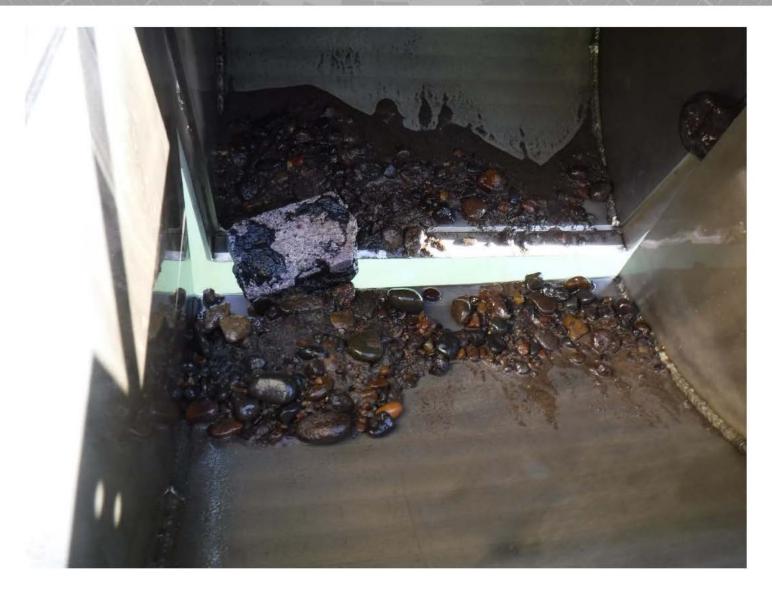
 Next step, move to Alt 1

Portland Harbor PDI Surface Sediment Sampling Log



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Station B419: Rock in jaws



Station B414: Wood Debris and Gravel

- Target location was under barge so went directly to 25 ft radius
- Primary station three failed attempts, no sediment recovery, located on slope with debris
- Alt 1 three attempts, all had some wood in the jaws, recovery was 17 cm, 10 cm, and 17 cm.
- Alt 2 did not go to this location because located very close to primary station and on the slope

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Station B414: Wood Debris and Gravel

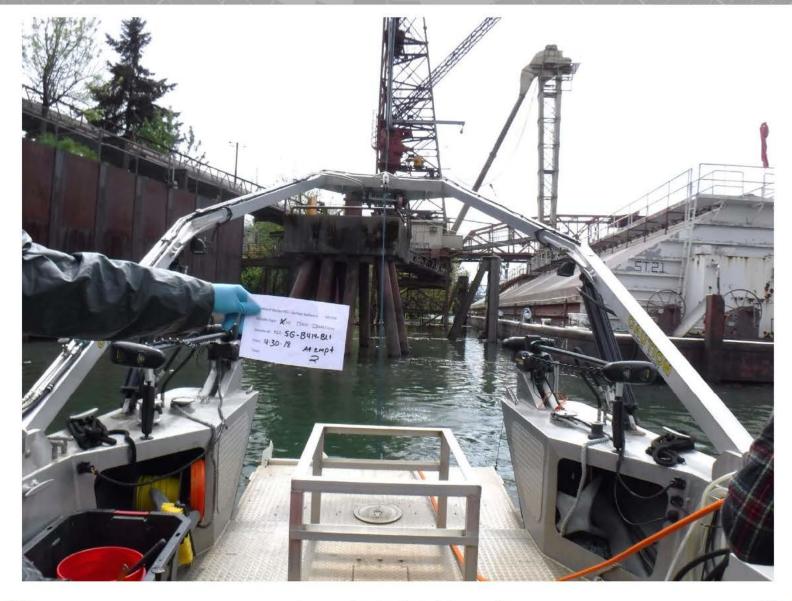
- Hand-probed area with weighted tape – woody, slope, sandy
- Alt 1 samples composited into 3point gravelly SAND sample and <u>archive</u> pending discussions with EPA
 - Compliant with approved FSP and "2 bowl" method not triggered here

Vessel (circle one): PV Tieton Cayuse						molino Per	sonnel	le.	Notes:	Atitz		
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Station B414: Nearshore Location

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Soft Sediment Accepted Sample 3 attempts at primary station (23, 23, and 20 cm depth)



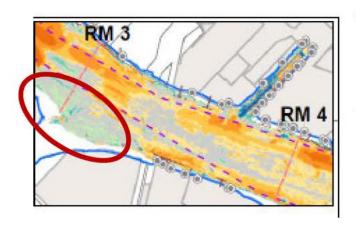


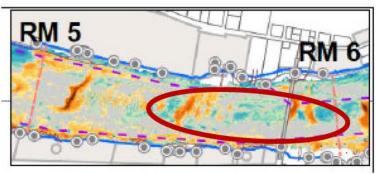
Scour Areas

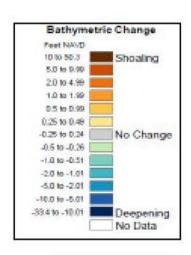
Bathymetry Changes – areas of scour

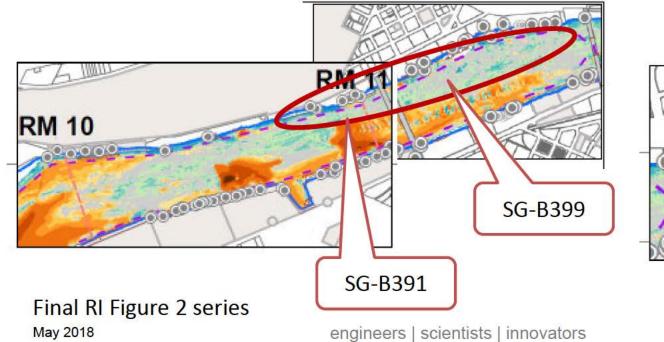
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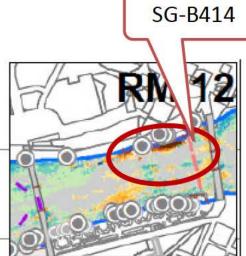
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Bathymetry Changes – areas of scour



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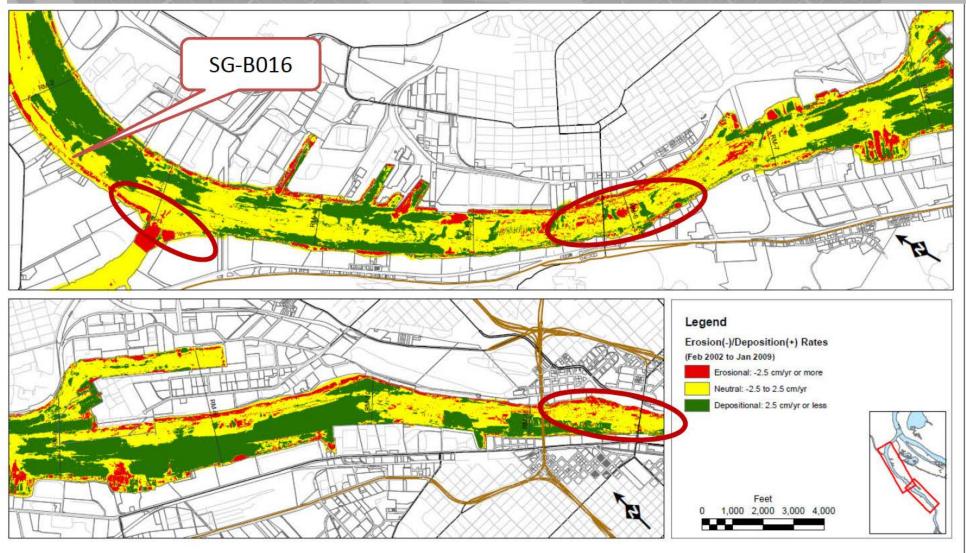
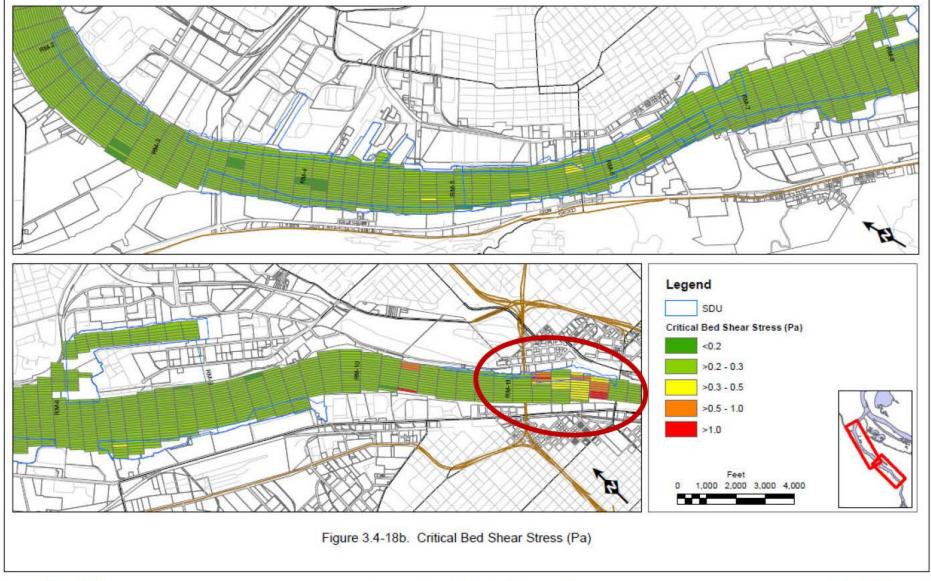


Figure 3.4-20. Sediment Denosition Rates

Bottom Shear Stress is high b/w RM 11 to 12 correlates with sand & gravel in grabs, avg ~15 cm

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Locations w/ 10 to 20 cm Avg Recovery Depth



	River Mile			Samp	le Depth	1	Lo	cation			
Sample ID		Date Sample Collected		tion Colle epth (cm)		Avg Sample Recovery Depth (cm)	Primary (w/in 25'/50' Radius)	Alt 1	Alt 2	# of Attempts	Substrate
SG-B001	1.9-3	3/30/2018	10	14	11	12	Υ			9	rocks/ riprap
SG-B016	2-3	4/1/2018	15	15	15	15	Υ			4	sand/gravel
SG-B027	2-3	4/1/2018	14	11	12	12	Υ			5	stiff silt
B040	2-3	4/3/2018	16	18	20	18	Υ			9	wood
B048	2-3	4/4/2018	14	10	13	12	Υ			12	sand/gravel
B050	3-4	4/4/2018	16	15	16	16	Υ			4	sand/gravel
B055	3-4	4/4/2018	8	13	11	11	Υ			7	gravel
B052	3-4	4/5/2018	18	15	13	15	Υ			9	wood
B053	3-4	4/5/2018	12	19	20	17	Υ			5	wood
B062	3-4	4/6/2018	19	17	14	17	Υ			10	sand
B066	3-4	4/8/2018	20	18	19	19	Υ			7	stiff silt
B084	3-4	4/9/2018	17	19	16	17	Υ			5	sand
B079	3-4	4/9/2018	21	21	16	19	Υ			5	
B103	4-4.5	4/10/2018	11	20	17	16	Υ			9	gravel/rocks

Excerpts from FSP

Excerpts of Approved Surface Sediment Field Sampling Plan

Section 1.2 Project Overview, p. 2

Surface sediment will be collected from a target depth of 0- to 30-centimeter depths, consistent with the RI (Intergral 2004). A minimum depth of 10 centimeters will be considered acceptable (especially if sampling on a sediment cap). Additionally, surface sediment samples will be collected from the D/U Reach. The D/U Reach stations will be located in sediment areas targeting fine-grained sediment and higher total organic carbon (TOC), generally similar to surface sediment within the Site; target ranges are discussed in Section 2.1.4. The sampling scheme and RAOs are also discussed in the PDI Work Plan (Geosyntec 2017).

Section 4.3 Sample Collection and Processing, p. 11

The hydraulic power grab samplers (similar to a van Veen grab sampler but with power-assist) will target collection of sediment from the upper 0 to 30 centimeters of sediment at three sampling points at each sample location (without adjusting vessel position); the three grab samples will be composited into a single sample for analysis. The three-point composite sample will be collected within a relatively small footprint around the sampling vessel (i.e., less than 25 feet). For example, grab #1 will be deployed, accepted, and processed on the deck of the vessel.

Excerpts of Approved Surface Sediment Field Sampling Plan

In general, the volume of sediment from the three-point surface grabs will be homogenized until uniform in color and texture. Color and texture will be described following the ASTM visual-soil classification method (Appendix A-1),. Sediments will be collected from the hydraulic power grab using a stainless-steel spoon, avoiding sediments in contact with the sides of the power grab. Large organisms and pieces of debris will be removed and noted in the sample log sheet (Appendix A-3). Acceptance criteria include the following (PSEP 1996; Integral 2004):

- No or minimal excess water leaking from the jaws of the sampler.
- No excessive turbidity in the overlaying water of the sampler.
- Sampler did not over-penetrate.
- 4. Sediment surface appears to be intact with minimal disturbance.
- Program-specific penetration (target 30 centimeters) has been achieved (minimum of 20 centimeter).

After sample acceptance, the sediment will be placed in a large, stainless-steel bowl for homogenization. Once the volume of sediment from each grab has been homogenized to a uniform consistency and color, composited sediments will be visually described following

Surface Sediment Field Sampling Plan

27 March 2018

4.4 Contingency Plan for Field Condition Impediments to Collecting Samples

During the sediment grab sampling efforts, the field crew may encounter field conditions that preclude collection of grab samples at the planned stations (e.g., limited access, poor recovery, safety concerns, debris/rock/bedrock causing refusal). A total of three attempts will be made to relocate the sample to an area within a 25-foot radius of the planned station. If an acceptable sample cannot be obtained within 25 feet, sample collection from within a 25-foot to 50-foot radius will be attempted.

For stratified random sample locations, if a sediment grab sample cannot be collected from within 50 feet of the target location due to inaccessibility or three failed grab attempts, the rerandomized Alternate Location 1 (Figure 6) will be attempted. If the Alternate Location 1 is inaccessible or three failed grab attempts occur, the re-randomized Alternate Location 2 (Figure 7) will be attempted. The field staff will notify the PDI Project Manager as soon as it is determined that a primary location and both alternatives cannot be sampled due to inaccessibility, and the EPA will be notified immediately by the PDI Project Coordinator. If three attempts at Alternative 2 locations fail to produce acceptable grab samples, then the three best sample attempts at this location will be retained for sample processing. The sampling depth will be recorded in the field notebooks. Sample location coordinates for Alternate 1 and Alternate 2 are provided in Tables 3 and 4, respectively. Alternate sampling locations were rerandomized using a GIS randomization program to maintain the geostatistical methods used during development of the PDI Work Plan (Geosyntec 2017). The rationale for moving to Alternate Location 1 or, if needed, Alternate Location 2, will be documented in the field log.

For SMA target locations, the radius protocol described above will be used. The rerandomization geostatistical methods are not necessary as a contingency plan for the SMA locations as these locations were not randomly generated. In the event that field conditions preclude the field crews from collecting proposed target samples within SMAs, attempts from within a 25-foot to 50-foot radius will be continued until an acceptable grab is obtained.

EPA "Two Bowl Flow Chart" Received 4/23/18

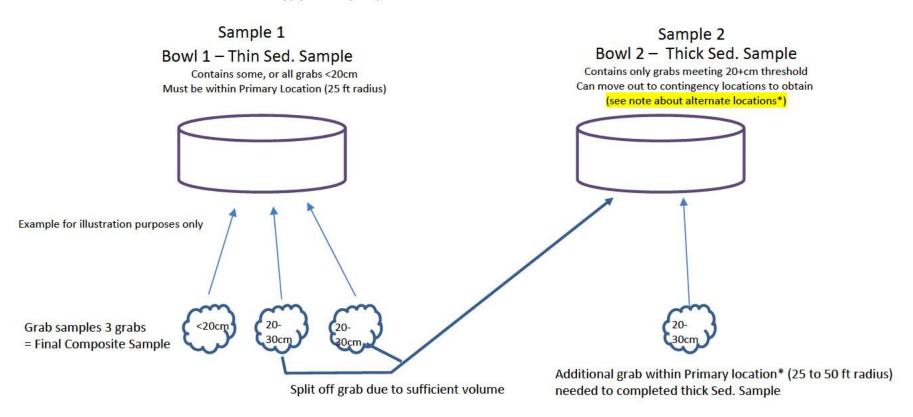
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Surface Sediment Sampling Approach for Hard Sediment Conditions¹

(when penetration threshold is not being met)

1 - Does not apply to debris, rock, or structure encounters



^{*}If alternative location is necessary – then the whole sample set and methodology above needs to be repeated if hard sediment is encountered

- bottom conditions
- FSP language
- Protocol